

**WHAT IS CLAIMED IS:**

1. A liquid crystal display device, comprising:

a liquid crystal display (LCD) panel, the LCD panel including a plurality of gate lines and a plurality of data lines crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern;

a gate driving unit for applying scan signals to the plurality of gate lines;

a lookup table for storing a gray scale value corresponding to a predetermined gray scale level of a displayable color;

a data processing unit for compensating image information according to the stored gray scale value; and

a data driving unit for receiving the compensated image information and for applying the compensated image information to the data lines.

2. The device of claim 1, wherein the predetermined gray scale level corresponds to a gray scale level of the displayable color prior to a reduction in a reproducibility of the displayable color.

3. The device of claim 1, wherein the stored gray scale value is the maximum gray scale value.

4. The device of claim 1, wherein the displayable color includes at least one of a red, green, and blue color.

5. The device of claim 1, wherein the displayable color is displayable at a plurality of gray scale levels.

5 6. The device of claim 1, wherein the lookup table stores gray scale values of a blue color.

7. The device of claim 6, wherein the lookup table stores gray scale values corresponding to 64-bit gray scale levels of the blue color.

10 8. The device of claim 7, wherein the maximum gray scale value corresponds to a 51<sup>st</sup> bit gray scale level of the blue color.

15 9. The device of claim 8, wherein gray scale values corresponding to a 52<sup>nd</sup> bit gray scale level to a 64<sup>th</sup> bit gray scale level are identical to a gray scale value of the 51<sup>st</sup> bit gray scale level.

10. The device of claim 1, wherein the lookup table stores gray scale values of blue, red, and green colors.

20 11. The device of claim 10, wherein gray scale values of the 52<sup>nd</sup> bit gray scale level to the 64<sup>th</sup> bit gray scale level are storable in the lookup table upon mixing gray scale

values of at least two of R, G, and B colors.

12. A method for improving a color reproducibility of a liquid crystal display (LCD) device, comprising:

5 increasing a gray scale value of at least one of a red (R), green (G), and blue (B) color;

detecting a gray scale value at which a color reproducibility of the LCD device is reduced;

10 storing a gray scale value corresponding to a predetermined gray scale level of a displayable color;

compensating a received image information, the received image information including the detected gray scale value; and

applying the compensated image information to data lines of the LCD device, the compensated image information including the maximum gray scale value.

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13. The method of claim 12, wherein the predetermined gray scale level corresponds to a gray scale level of the displayable color prior to a reduction in a reproducibility of the displayable color.

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14. The method of claim 12, wherein the stored gray scale value is the maximum gray scale value.

15. The method of claim 12, wherein the detecting includes measuring a gray scale level of a displayable color.

16. The method of claim 15, wherein the displayable color includes at least one of a red, green, and blue color.

17. The method of claim 12, wherein the maximum gray scale value corresponds to a 51<sup>st</sup> bit gray scale level of the blue color.

18. The method of claim 17, wherein the gray scale value at which the color reproducibility is reduced corresponds to a 52<sup>nd</sup> one of 64 bits of gray scale levels of blue color displayable by the LCD device.

19. A method of driving a display device, comprising:  
receiving image information, the image information including a gray scale value corresponding to a color displayable by the display device;  
determining whether the gray scale value is greater than a predetermined corresponding gray scale level at which the color is displayable by the display panel;  
applying the image information to the LCD device if it is determined the gray scale value is not greater than the predetermined corresponding gray scale level; and  
compensating the image information if it is determined the gray scale value is greater than the predetermined corresponding gray scale level.

20. The method of claim 19, further comprising applying the compensated image information to the plurality of data lines.

5 21. The method of claim 19, wherein the color is at least one of a red, green, and blue color.

22. The method of claim 19, wherein the predetermined corresponding gray scale level corresponds to a gray scale level of the color displayable by the display device,  
10 wherein the color is displayable at a reduced color reproducibility.

23. The method of claim 19, wherein the compensating includes mixing gray scale values of at least two of red, green, and blue colors.